DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, KANSAS CITY DISTRICT
635 FEDERAL BUILDING
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KANSAS CITY MO 64106-2824

March 4, 2015

Mr. Brad Vann, Remedial Project Manager
U.S. Environmental Protection Agency Region 7
11201 Renner Boulevard
Lenexa, KS 66219

Dear Mr. Vann:

The U.S. Army Corps of Engineers (USACE) has completed a technical review of the "Bridgeton Landfill Thermal Isolation Barrier Investigation Phase 1 Report" dated December 2014 and prepared by Feezor Engineering of Bridgeton, Missouri and P.J. Carey & Associates of Sugar Hill, Georgia on behalf of Bridgeton Landfill, LLC. These comments were originally transmitted to you on January 30, 2015. USACE comments are as follows:

1) General: Recommend the RPs perform additional bounding sampling near elevated locations to determine whether or not contamination extends outside these areas where no "clean" borings exist.

2) General: Recommend the RPs perform additional sampling southward towards the North Quarry area. Ideally samples could be placed on a systemic grid to ensure full coverage, given the heterogeneity of how RIM was placed in the landfill. There's a lot of value in using historic imagery to try to identify areas of potential concern. Recommend RPs obtain and utilize historic imagery to help support sampling locations, if it is available. This imagery would need to be cited and copies provided in reports to justify sampling locations if other than a grid is utilized.

3) General: Recommend the RP/EPA revisit some assumptions of the Baseline Risk Assessment using this new data and any future collected data as part of the RIM characterization to ensure site conditions are still similar to what has been previously assessed. It's possible to calculate the total amount of Thorium-230 disposed of in 8,700 tons of waste material, this value is ~1.5E15 pCi.

   Using the UCL95 values provided in the BLRA you arrive at a total accounted for activity of 1.3E15, or about 90% of the material is accounted for, which is probably a pretty good estimate.

   Conversely, if the average value is used, you arrive at an accounted for activity of only 7.5E14, which is roughly 50% of the material...

With this new data it's possible the material is present in a larger area (seems to be the case supported by new data, though Area 2 still makes up the bulk of contaminated media), is present in thicker layers, and/or is present at higher activities than what was assumed in the BLRA (and has been carried through to documents up to, and including the 2008 ROD).

4) Figures: If the data is available it would help to also plot the results of samples below the depth of contamination, or the CPT gamma results plotted for the interval below the highest results. i.e. it's helpful at location Sonic 1-2 to see that the interval immediately below the high sample was non-detect, whereas at Sonic 1C-6 it's not immediately clear if a "Clean" sample was ever identified. It would also help to perhaps color code or otherwise identify borings where elevated material is found. While the posting plots are useful, it's hard to get a good visual summary of the data as presented.

5) Section 1, pg 7, paragraph: Report states, "Although these criteria identify levels that would allow for unrestricted use of the site (which as indicated above is not realistic or allowed at a solid waste disposal facility), these criteria have no relationship to risk-based criteria for a solid waste landfill or levels that would be protective if an SSE were to occur in these materials." Recommend that report also state that risk-based criteria for this site has not been determined, therefore, comparison to unrestricted use criteria is being used.

6) Section 1.1.2.2, pg 8, paragraph 4: Report states that monthly groundwater levels measured in 2000 and 2005 indicated that groundwater generally occurs only in the underlying alluvium at or below the base of the landfill material. Recommend that recent groundwater levels be reviewed and also cited to indicate whether current data also shows the groundwater level is still at or below the depth of waste. Or could reference section 7.2 to indicate that 2013 investigation results confirm that current conditions still indicate fluid levels at or below the base of the landfill material, which is consistent with the 2000 and 2005 groundwater levels.

7) Section 1.1.3, page 9: This paragraph references the proposed thermal isolation barrier location. Two alignment alternatives have been proposed. Recommend including a figure or figures to indicate which IB location is being referred to.

8) Section 1.1.3.2, page 9, paragraph 2: Report states Lab analysis of surface soil samples (the upper 6 inches) detected radionuclides at levels above 5 pCi/g above background at boring locations WL-106 and WL-114. Figure 2 only shows WL-106B. Is this the same well as WL-106?

9) Figure 2: Figure references "elevated" and "non-elevated" historical boundaries. Recommend all figures be changed to quantify the "elevated" levels. Also recommend that areas of surface RIM be clearly identified.

10) Section 3.2.5, page 17, paragraph 2: In this paragraph, and at several other locations in the document, it is stated that a screening value of 200-250 cps was used to identify potentially elevated gamma readings. Recommend an explanation be provided on how that screening level was determined.

11) Section 4.2.1, page 24, paragraph 2: Last sentence states, "Samples were then geologically logged, photographed, scanned for radiation, and samples for radiological analyses were selected." Recommend this section be expanded to indicate how the samples for radiological analyses were selected and how the number of samples selected was determined or reference section 4.4 where further discussion is provided.

12) Section 4.2.2, page 25: Section identifies sonic borehole locations selected if GCPT data indicated the potential for RIM (1-2, 2-2, 5-3, 1C-6). Also states 8-1 and WL-119 were selected to further understand slightly elevated GCPT sounding results. Should the "if" be changed to "because"? "if" implies the borings were pre-selected. Also, there is no mention of why sonic boreholes 12-5, 13-3, 13-6, 14-2, 14-4, 14-5, 14-7, 15-2 (& 2A), 16-3, and 16-6 were drilled.

13) Section 4.4, page 27, paragraph 1: States "Intervals with elevated gamma readings were selected for offsite laboratory analysis." Recommend adding text to clarify what constitutes an "elevated gamma reading". Also, recommend clarifying if the samples taken from the interval were from locations that exhibited the highest 2 gamma reading in each interval. Were samples taken if there were no elevated gamma readings? Was there an attempt to collect samples above and below the elevated readings to identify if the vertical extent of RIM had been identified?

14) Section 5.3.1, page 31, paragraph 2: TLD monitoring information is discussed. Recommend EPA determine if they want to see these results summarized in an appendix to be able to verify the effort and results.

15) Section 5.3.5 and 5.3.6, page 32: Recommend RPA determine if they want to see results for survey logs for daily personnel radiation surveys and four gas monitoring included in an appendix so EPA can verify the effort and results.

16) Section 5.3.5, page 32: This section does not provide narrative summary of results of four gas monitoring as the other sections do. Recommend results summary statement be included, since backup data isn't provided in an appendix.

17) Section 5.3.8.1, page 33: Recommend stating how alpha readings above 20 dpm/100cm2 and beta-gamma readings above 1000 dpm/100 cm2 were determined to be contaminated. This comment would apply to sections 5.3.8.2 and 5.3.8.3, which also use this same reference level.

18) Section 6, page 34, paragraph 1: States " based upon review of historic images, it was determined during the investigation that a deeper quarry existed in the southeast portion of OU1 Area 1 that could be problematic to the barrier design. " Are you referring to Bridgeton Sanitary LF N. Quarry? If so, should state that so it doesn't appear to be some newly identified feature.

19) Appendix C3 & Figure 6: Sonic downhole borehole log and core scan shows columns for samples collected and shipped. Figure 6, sonic boring 1-2 shows a sample was collected at depths of 8-9', 18-19', 20-21', 22-23', 24-25', 28-29', 33-34', 38-39', 39-40', and 40-41' and results were provided. However, the sample shipped box on the log was only checked for samples 28-29' and 39-40'. Recommend boring logs be checked to ensure they are complete and correct.

20) General: Recommend another set of figures be generated that contain all results, including past sample results and recent sample for each radionuclide to facilitate a better understanding of RIM distribution in Area 1. Recommend removal of historical interpolated boundaries from these additional figures as they have been disproven.

21) Cross Sections: Recommend the lab results for sonic borings in each cross section at each depth a sample was collected be shown. Cross referencing between logs, downhole scans, and lab reports is confusing and time-consuming; having as much of the pertinent data at one glance would aid in understanding the contaminant distribution.

22) Figure 14: The profile shows GCPT-12 hit alluvium at elevation 442. However, on the 1971 aerial it appears the elevation at this location is ~432 along the edge of what appears to be a lagoon and is where the 1C-12 is located. In a 1973 aerial it appears the lagoon is essentially filled in. Is it possible that what is being classified as alluvium is actually spoils from the quarrying operation or some other type of fill?

USACE is available to participate in a comment resolution meeting upon request.

Respectfully,

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